

## Claims.

1 1. A method for deploying a computer application on a  
2 network, comprising the steps of:

3 installing an application on a local file system of  
4 an application server to define a locally installed ap-  
5 plication; and

6 relocating said locally installed application onto a  
7 shared file system by the steps of:

8 identifying shareable files among files of said  
9 application, said shareable files being shareable  
10 among multiple instances of said application;

11 moving said shareable files from said locally in-  
12 stalled application to said shared file system to de-  
13 fine relocated files; and

14 establishing symbolic links on said application  
15 server that are directed to corresponding locations  
16 of said relocated files.

1 2. The method according to claim 1, wherein said step  
2 of relocating said locally installed application further  
3 comprises the steps of:

4 identifying instance read/write files among said  
5 files of said application; and

6 establishing said instance read/write files in at  
7 least one subtree of said local file system.

1        3. The method according to claim 1, further compris-  
2        ing the steps of:

3               initializing a cache in said application server; and  
4               executing a configuration script following perform-  
5               ance of said steps of installing an application and relo-  
6               cating said locally installed application.

1        4. The method according to claim 1, wherein said step  
2        of relocating said locally installed application further  
3        comprises associating at least one application file ele-  
4        ment with a 4-tuple, wherein:

5               a first value SharedDir of said 4-tuple specifies a  
6               root directory in said shared file system;

7               a second value LocalDir of said 4-tuple specifies a  
8               first subdirectory in said local file system;

9               a third value policy of said 4-tuple specifies a file  
10              creation policy that applies to said local file system;  
11              and

12              a fourth value script is a reference to a configura-  
13              tion script.

1        5. The method according to claim 4, wherein said  
2        third value policy specifies a step of creating said  
3        first subdirectory in said local file system.

1        6. The method according to claim 4, wherein said file  
2        creation policy specifies a step of creating a first sym-  
3        bolic link in said local file system to a remote file.

1        7. The method according to claim 4, wherein said file  
2 creation policy specifies creating in said local file  
3 system a first symbolic link to a remote subdirectory and  
4 a second symbolic link to a remote file.

1        8. The method according to claim 4, further compris-  
2 ing the step of modifying at least one of said files of  
3 said application by executing said configuration script.

1        9. The method according to claim 4, wherein said step  
2 of relocating said locally installed application is per-  
3 formed by:

4        in a first event that said file creation policy  
5 specifies the step of creating one of said symbolic  
6 links.

1        10. The method according to claim 4, wherein said  
2 step of relocating said locally installed application  
3 further comprises the step of:

4        in a second event that said file creation policy  
5 specifies an exclusive creation of subdirectories, creat-  
6 ing said first subdirectory in said local file system.

1        11. The method according to claim 10, wherein said  
2 step of creating said first subdirectory comprises adding  
3 said first subdirectory to a set of subdirectories to be  
4 created.

1        12. The method according to claim 4, wherein said ap-  
2        plication file element comprises said root directory.

1        13. The method according to claim 12, wherein said  
2        step of relocating said locally installed application is  
3        performed by successively associating application file  
4        elements of said root directory with said 4-tuple.

1        14. The method according to claim 13, wherein said  
2        step of relocating said locally installed application is  
3        performed by recursively mapping a subtree of said local  
4        file system onto said shared file system.

1        15. The method according to claim 13, wherein at  
2        least a portion of said application file elements of said  
3        root directory are substituted for said first value  
4        SharedDir and said second value LocalDir of said 4-tuple.

1        16. The method according to claim 4, further compris-  
2        ing the step of executing said configuration script.

1        17. The method according to claim 4, wherein said  
2        step of relocating said locally installed application is  
3        performed by:

4        in a first event that said file creation policy  
5        specifies creation of said symbolic links, creating one  
6        of said symbolic links; and

7 in a second event that said file creation policy  
8 specifies exclusive creation of subdirectories, creating  
9 said first subdirectory in said local file system.

1 18. The method according to claim 17, wherein said  
2 step of creating said subdirectory comprises adding said  
3 first subdirectory to a set of subdirectories to be cre-  
4 ated.

1 19. The method according to claim 17, wherein said  
2 application file element comprises said root directory.

1 20. The method according to claim 19, wherein said  
2 step of relocating said locally installed application is  
3 performed by successively associating application file  
4 elements of said root directory with said 4-tuple.

1 21. The method according to claim 20, wherein said  
2 step of relocating said locally installed application is  
3 performed by recursively mapping a subtree of said local  
4 file system onto said shared file system.

1 22. The method according to claim 20, wherein at  
2 least a portion of said application file elements of said  
3 root directory are substituted for said first value  
4 SharedDir and said second value LocalDir of said 4-tuple.

1       23. A method for deploying a computer application on  
2 a network, comprising the steps of:

3       selecting an application server of a cluster for ap-  
4 plication priming thereof;

5       installing an application on a local file system of  
6 said application server according to an installation pro-  
7 cedure of an installation management node of said cluster  
8 to define a locally installed application;

9       relocating said locally installed application onto a  
10 shared file system, wherein said shared file system mir-  
11 rors an application directory of said installation man-  
12 agement node, by the steps of:

13       identifying files of said application as func-  
14 tionally read-only files, instance read/write files,  
15 and application read/write files;

16       moving said functionally read-only files from  
17 said locally installed application to said shared  
18 file system to define relocated functionally  
19 read-only files;

20       moving said application read/write files from  
21 said locally installed application to said shared  
22 file system to define relocated application  
23 read/write files;

24       automatically establishing said instance  
25 read/write files in at least one subtree of said lo-  
26 cal file system; and

27       automatically establishing symbolic links on said  
28 application server that are directed to corresponding

29 locations of said relocated functionally read-only  
30 files and said relocated application read/write  
31 files.

1 24. The method according to claim 23, wherein said  
2 relocated functionally read-only files comprise a con-  
3 figuration file.

1 25. The method according to claim 23, wherein said  
2 step of identifying said files of said application is  
3 performed off-line.

1 26. The method according to claim 23, wherein said  
2 steps of selecting an application server, installing said  
3 application, and relocating said application are per-  
4 formed using a data management process and a daemon,  
5 wherein said daemon executes on said application server.

1 27. The method according to claim 26, wherein said  
2 application server comprises a plurality of application  
3 servers that receive a multicast, said multicast being  
4 initiated by said data management process while at least  
5 one of said steps of selecting an application server, in-  
6 stalling said application, and relocating said applica-  
7 tion is being performed.

1        28. The method according to claim 23, wherein said  
2 step of relocating said locally installed application  
3 further comprises mapping a 4-tuple, wherein:

4        a first value SharedDir of said 4-tuple specifies a  
5 root directory in said shared file system;

6        a second value LocalDir of said 4-tuple specifies a  
7 first subdirectory in said local file system;

8        a third value policy of said 4-tuple specifies a file  
9 creation policy that applies to said local file system;

10       and

11       a fourth value script is a reference to a configura-  
12 tion script.

1       29. The method according to claim 28, wherein said  
2 file creation policy specifies a step of creating said  
3 first subdirectory in said local file system.

1       30. The method according to claim 28, wherein said  
2 file creation policy specifies a step of creating a first  
3 symbolic link in said local file system to a remote file.

1       31. The method according to claim 28, wherein said  
2 file creation policy specifies creating in said local  
3 file system a first symbolic link to a remote subdirec-  
4 tory and a second symbolic link to a remote file.



1        32. The method according to claim 28, wherein said  
2 configuration script modifies said files of said applica-  
3 tion, wherein said files of said application are located  
4 on said local file system.

1        33. A computer software product, comprising a com-  
2 puter-readable medium in which computer program instruc-  
3 tions are stored, wherein said instructions, when read by  
4 a computer, cause the computer to deploy an application  
5 on a network by executing the steps of:

6        installing an application on a local file system of  
7 an application server to define a locally installed ap-  
8 plication; and

9        relocating said locally installed application onto a  
10 shared file system by the steps of:

11        identifying shareable files among files of said  
12 application, said shareable files being shareable  
13 among multiple instances of said application;

14        moving said shareable files from said locally in-  
15 stalled application to said shared file system to de-  
16 fine relocated files; and

17        establishing symbolic links on said application  
18 server that are directed to corresponding locations  
19 of said relocated files.

1        34. The computer software product according to  
2 claim 33, wherein said step of relocating said locally  
3 installed application further comprises the steps of:

4 identifying instance read/write files among said  
5 files of said application; and  
6 establishing said instance read/write files in at  
7 least one subtree of said local file system.

1 35. The computer software product according to  
2 claim 33, further comprising the step of executing a con-  
3 figuration script following performance of said steps of  
4 installing an application and relocating said locally in-  
5 stalled application.

1 36. The computer software product according to  
2 claim 33, wherein said step of relocating said locally  
3 installed application further comprises associating at  
4 least one application file element with a 4-tuple,  
5 wherein:

6 a first value SharedDir of said 4-tuple specifies a  
7 root directory in said shared file system;

8 a second value LocalDir of said 4-tuple specifies a  
9 first subdirectory in said local file system;

10 a third value policy of said 4-tuple specifies a file  
11 creation policy that applies to said local file system;  
12 and

13 a fourth value script is an optional reference to a  
14 configuration script.

1        37. The computer software product according to  
2 claim 36, wherein said file creation policy specifies a  
3 step of creating said first subdirectory in said local  
4 file system.

1        38. The computer software product according to  
2 claim 36, wherein said file creation policy specifies a  
3 step of creating a first symbolic link in said local file  
4 system to a remote file.

1        39. The computer software product according to  
2 claim 36, wherein said file creation policy specifies  
3 creating in said local file system a first symbolic link  
4 to a remote subdirectory and a second symbolic link to a  
5 remote file.

1        40. The computer software product according to  
2 claim 36, further comprising the step of modifying at  
3 least one of said files of said application by executing  
4 said configuration script.

1        41. The computer software product according to  
2 claim 36, further comprising the step of modifying at  
3 least one system file by executing said configuration  
4 script.

1        42. The computer software product according to  
2 claim 36, wherein said step of relocating said locally  
3 installed application is performed by:

4        in a first event that said file creation policy  
5 specifies creation of said symbolic links, creating one  
6 of said symbolic links.

1        43. The computer software product according to  
2 claim 36, wherein said step of relocating said locally  
3 installed application is performed by:

4        in a second event that said file creation policy  
5 specifies exclusive creation of subdirectories, creating  
6 said first subdirectory in said local file system.

1        44. The computer software product according to  
2 claim 43, wherein said step of creating said first subdi-  
3 rectory comprises adding said first subdirectory to a set  
4 of subdirectories to be created.

1        45. The computer software product according to  
2 claim 36, wherein said application file element comprises  
3 said root directory.

1        46. The computer software product according to  
2 claim 45, wherein said step of relocating said locally  
3 installed application is performed by successively asso-  
4 ciating application file elements of said root directory  
5 with said 4-tuple.

1        47. The computer software product according to  
2 claim 46, wherein said step of relocating said locally  
3 installed application is performed by recursively mapping  
4 a subtree of said local file system onto said shared file  
5 system.

1        48. The computer software product according to  
2 claim 46, wherein during said step of relocating said lo-  
3 cally installed application at least a portion of said  
4 application file elements of said root directory are sub-  
5 stituted for said first value SharedDir and said second  
6 value LocalDir of said 4-tuple.

1        49. The computer software product according to  
2 claim 36, further comprising the step of executing said  
3 configuration script.

1        50. The computer software product according to  
2 claim 36, wherein said step of relocating said locally  
3 installed application is performed by:

4        in a first event that said file creation policy  
5 specifies creation of said symbolic links, creating one  
6 of said symbolic links; and

7        in a second event that said file creation policy  
8 specifies exclusive creation of subdirectories, creating  
9 said first subdirectory in said local file system.

1        51. The computer software product according to  
2 claim 50, wherein said step of creating said first subdi-  
3 rectory comprises adding said first subdirectory to a set  
4 of subdirectories to be created.

1        52. The computer software product according to  
2 claim 50, wherein said application file element comprises  
3 said root directory.

1        53. The computer software product according to  
2 claim 52, wherein said step of relocating said locally  
3 installed application is performed by successively asso-  
4 ciating application file elements of said root directory  
5 with said 4-tuple.

1        54. The computer software product according to  
2 claim 53, wherein said step of relocating said locally  
3 installed application is performed by recursively mapping  
4 a subtree of said local file system onto said shared file  
5 system.

1        55. The computer software product according to  
2 claim 53, wherein at least a portion of said application  
3 file elements of said root directory are substituted for  
4 said first value SharedDir and said second value LocalDir  
5 of said 4-tuple.

1        56. A computer software product, comprising a com-  
2        puter-readable medium in which computer program instruc-  
3        tions are stored, wherein said instructions, when read by  
4        a computer, cause the computer to deploy an application  
5        on a network by executing the steps of:

6            selecting an application server of a cluster for ap-  
7        plication priming thereof;

8            installing an application on a local file system of  
9        said application server according to an installation pro-  
10       cedure of an installation management node of said cluster  
11       to define a locally installed application;

12           relocating said locally installed application onto a  
13       shared file system, wherein said shared file system mir-  
14       rors an application directory of said installation man-  
15       agement node, and said step of relocating said locally  
16       installed application is performed by:

17            identifying files of said application as func-  
18       tionally read-only files, instance read/write files,  
19       and application read/write files;

20            moving said functionally read-only files from  
21       said locally installed application to said shared  
22       file system to define relocated functionally  
23       read-only files;

24            moving said application read/write files from  
25       said locally installed application to said shared  
26       file system to define relocated application  
27       read/write files;

28 automatically establishing said instance  
29 read/write files in at least one subtree of said lo-  
30 cal file system; and

31 automatically establishing symbolic links on said  
32 application server that are directed to corresponding  
33 locations of said relocated functionally read-only  
34 files and said relocated application read/write  
35 files.

1 57. The computer software product according to  
2 claim 56, wherein said relocated functionally read-only  
3 files comprise a configuration file.

1 58. The computer software product according to  
2 claim 56, wherein said step of identifying files of said  
3 application is performed off-line.

1 59. The computer software product according to  
2 claim 56, wherein said steps of selecting an application  
3 server, installing an application, and relocating said  
4 locally installed application are performed using a data  
5 management process and a daemon, wherein said daemon exe-  
6 cutes on said application server.



1        60. The computer software product according to  
2 claim 59, wherein said application server comprises a  
3 plurality of application servers that receive a multi-  
4 cast, said multicast being initiated by said data manage-  
5 ment process while at least one of said steps of select-  
6 ing an application server, installing an application, and  
7 relocating said locally installed application is being  
8 performed.

1        61. The computer software product according to  
2 claim 56, wherein said step of relocating said locally  
3 installed application further comprises mapping a  
4 4-tuple, wherein:

5        a first value SharedDir of said 4-tuple specifies a  
6 root directory in said shared file system;

7        a second value LocalDir of said 4-tuple specifies a  
8 first subdirectory in said local file system;

9        a third value policy of said 4-tuple specifies a file  
10 creation policy that applies to said local file system;  
11 and

12       a fourth value script is a reference to a configura-  
13 tion script.

1        62. The computer software product according to  
2 claim 61, wherein said file creation policy specifies a  
3 step of creating said first subdirectory in said local  
4 file system.

1        63. The computer software product according to  
2 claim 61, wherein said file creation policy specifies a  
3 step of creating a first symbolic link in said local file  
4 system to a remote file.

1        64. The computer software product according to  
2 claim 61, wherein said file creation policy specifies  
3 creating in said local file system a first symbolic link  
4 to a remote subdirectory and a second symbolic link to a  
5 remote file.

1        65. The computer software product according to  
2 claim 61, wherein said configuration script modifies said  
3 files of said application, wherein said files of said ap-  
4 plication are located on said local file system.

1        66. A computer system comprising:  
2 a computer having computer program instructions  
3 stored therein, wherein said instructions, when read by  
4 said computer, cause said computer to deploy an applica-  
5 tion on a network by executing the steps of:

6 installing an application on a local file system of  
7 an application server to define a locally installed ap-  
8 plication; and

9 relocating said locally installed application onto a  
10 shared file system by the steps of:

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11 identifying shareable files among files of said  
12 application, said shareable files being shareable  
13 among multiple instances of said application;  
14 moving said shareable files from said locally in-  
15 stalled application to said shared file system to de-  
16 fine relocated files; and  
17 establishing symbolic links on said application  
18 server that are directed to corresponding locations  
19 of said relocated files.

1 67. The computer system according to claim 66,  
2 wherein said step of relocating said locally installed  
3 application further comprises the steps of:  
4 identifying instance read/write files among said  
5 files of said application; and  
6 establishing said instance read/write files in at  
7 least one subtree of said local file system.

1 68. The computer system according to claim 66, fur-  
2 ther comprising the steps of:  
3 initializing a cache in said application server; and  
4 executing a configuration script following perform-  
5 ance of said steps of installing an application and relo-  
6 cating said locally installed application.

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1        69. The computer system according to claim 66,  
2 wherein said step of relocating said locally installed  
3 application further comprises associating at least one  
4 application file element with a 4-tuple, wherein:

5        a first value SharedDir of said 4-tuple specifies a  
6 root directory in said shared file system;

7        a second value LocalDir of said 4-tuple specifies a  
8 first subdirectory in said local file system;

9        a third value policy of said 4-tuple specifies a file  
10 creation policy that applies to said local file system;  
11 and

12       a fourth value script is a reference to a configura-  
13 tion script.

1       70. The computer system according to claim 69,  
2 wherein said file creation policy specifies a step of  
3 creating said first subdirectory in said local file sys-  
4 tem.

1       71. The computer system according to claim 69,  
2 wherein said file creation policy specifies a step of  
3 creating a first symbolic link in said local file system  
4 to a remote file.

1       72. The computer system according to claim 69,  
2 wherein said file creation policy specifies creating in  
3 said local file system a first symbolic link to a remote  
4 subdirectory and a second symbolic link to a remote file.

1        73. The computer system according to claim 69,  
2 wherein said configuration script modifies at least one  
3 of said files of said application, wherein said files of  
4 said application are located on said local file system.

1        74. The computer system according to claim 69,  
2 wherein said configuration script modifies at least one  
3 of said files of said application.

1        75. The computer system according to claim 69,  
2 wherein said configuration script modifies at least one  
3 system file.

1        76. The computer system according to claim 69,  
2 wherein said step of relocating said locally installed  
3 application is performed by:

4        in a first event that said file creation policy  
5 specifies creation of said symbolic links, creating one  
6 of said symbolic links.

1        77. The computer system according to claim 69,  
2 wherein said step of relocating said locally installed  
3 application is performed by:

4        in a second event that said file creation policy  
5 specifies exclusive creation of subdirectories, creating  
6 said first subdirectory in said local file system.

1        78. The computer system according to claim 77,  
2 wherein said step of creating said first subdirectory  
3 comprises adding said first subdirectory to a set of sub-  
4 directories to be created.

1        79. The computer system according to claim 69,  
2 wherein said application file element comprises said root  
3 directory.

1        80. The computer system according to claim 79,  
2 wherein said step of relocating said locally installed  
3 application is performed by successively associating ap-  
4 plication file elements of said root directory with said  
5 4-tuple.

1        81. The computer system according to claim 80,  
2 wherein said step of relocating said locally installed  
3 application is performed by recursively mapping a subtree  
4 of said local file system onto said shared file system.

1        82. The computer system according to claim 80,  
2 wherein during said step of relocating said locally in-  
3 stalled application at least a portion of said applica-  
4 tion file elements of said root directory are substituted  
5 for said first value SharedDir and said second value Lo-  
6 calDir of said 4-tuple.

1       83. The computer system according to claim 69, fur-  
2 ther comprising the step of executing said configuration  
3 script.

1       84. The computer system according to claim 69,  
2 wherein said step of relocating said locally installed  
3 application is performed by:

4       in a first event that said file creation policy  
5 specifies creation of said symbolic links, creating one  
6 of said symbolic links; and

7       in a second event that said file creation policy  
8 specifies exclusive creation of subdirectories, creating  
9 said first subdirectory in said local file system.

1       85. The computer system according to claim 84,  
2 wherein said step of creating said first subdirectory  
3 comprises adding said first subdirectory to a set of sub-  
4 directories to be created.

1       86. The computer system according to claim 84,  
2 wherein said application file element comprises said root  
3 directory.

1       87. The computer system according to claim 86,  
2 wherein said step of relocating said locally installed  
3 application is performed by successively associating ap-  
4 plication file elements of said root directory with said  
5 4-tuple.

1        88. The computer system according to claim 87,  
2 wherein said step of relocating said locally installed  
3 application is performed by recursively mapping a subtree  
4 of said local file system onto said shared file system.

1        89. The computer system according to claim 87,  
2 wherein at least a portion of said application file ele-  
3 ments of said root directory are substituted for said  
4 first value SharedDir and said second value LocalDir of  
5 said 4-tuple.